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SPECIFICATION FOR GLASS GLOBES FOR INTERNAL LIGHTING OF PASSENGER COACHES

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MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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SPECIFICATION FOR GLASS GLOBES FOR INTERNAL LIGHTING OF PASSENGER COACHES

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Indian Standard

SPECIFICATION FOR GLASS GLOBES FOR INTERNAL LIGHTING OF PASSENGER COACHES

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 1 August 1970, after the draft finalized by the Glassware Sectional Committee had been approved by the Chemical Division Council.

0.2 A variety of glass globes are used for internal lighting purposes in passenger coaches, such asbuses and railways, and in ship cabins. For the convenience of securing to the light assembly, glass globes are made both with or without a flange. Globes with screw-in type fitting parts are also sometimes used, particularly in ship cabins. However, this standard does not deal with globes used with screw-in type fitting part.

0.3 In this standard, stress has been laid on the rigidness of their design and interchangeably in any particular size to ensure an effective fitting with a view to safeguarding against damage due to vibrations and jerks which are common in the course of their usage.

0.4 In the formulation of this standard, assistance has been derived from the following publications:

JIS F 8402-1963 Glass globes for marine electric lights. Japanese Standard Association.

SPL/GLQBES/TL/66 Specification for glass globes used for internal lights of passenger coaches. Northern Railway, Government of India.

0.5 This standard captains clauses **3.1.1, 8.1**(c) and **8. 2** which call for agreement between the purchaser and the supplier.

0.6 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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*Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard prescribes dimensional requirements and the methods of sampling and test for glass globes used for internal lighting of passenger coaches.

1.1.1 This standard does not deal with accessories used for the fitting of glass globes.

2. TERMINOLOGY

2.1 For the purpose of this standard, definitions given in IS : 1382-1961* shall apply.

3. TYPES AND SIZES

3.1 There shall be three types of globes, namely:

Type A — made of clear glass;

Type B — made of clear glass but frosted by etching or sand blasting on the inner surface in order to produce a light-diffusing texture; and

Type C — made of opal glass with high transmittancy, offering good brightness of light without showing the glare of the filament of clear bulb within the globe.

3.1.1 Globes of types A and B may also be made of coloured glass if desired by the purchaser.

3.2 The sizes of glass globes shall be determined by the outside diameter of the globe.

3.3 The types and sizes of globes shall be as given in Table 1.

TABLE 1 TYPES AND SIZES OF GLASS GLOBES

TYPES	SIZES	FIG.
A, B and C	90 120 135	1
	120 170	2
	175	3
	130	4
B and C	250 300 350	5, 6 and 7
	900	8
	206	9

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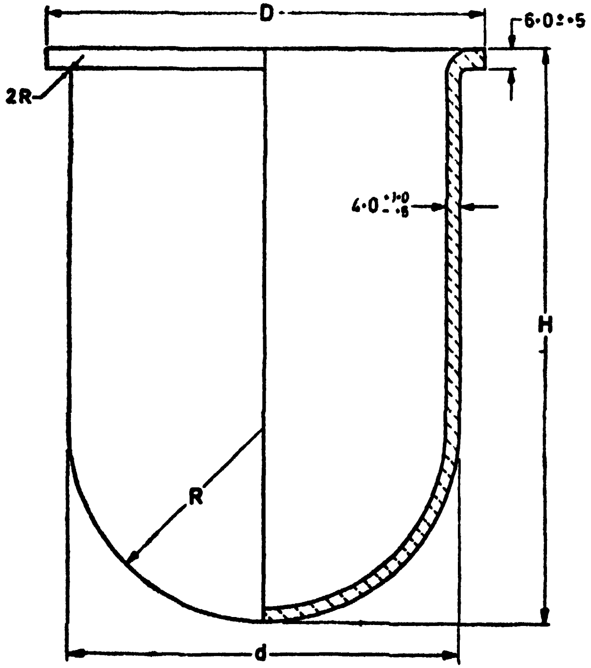
*Glossary of terms relating to glass industry.



All dimensions in millimetres.

SIZES	*D* (dia)	*d* (dia)	*H*	*R*
90	105±0 - 2	90+0 —9	150±1	44+0 - 1
120	135+0 —2	120+0 - 2	175±1	59+0 - 1
135	155+0	135+0 - 2	220±1	66+0 -1

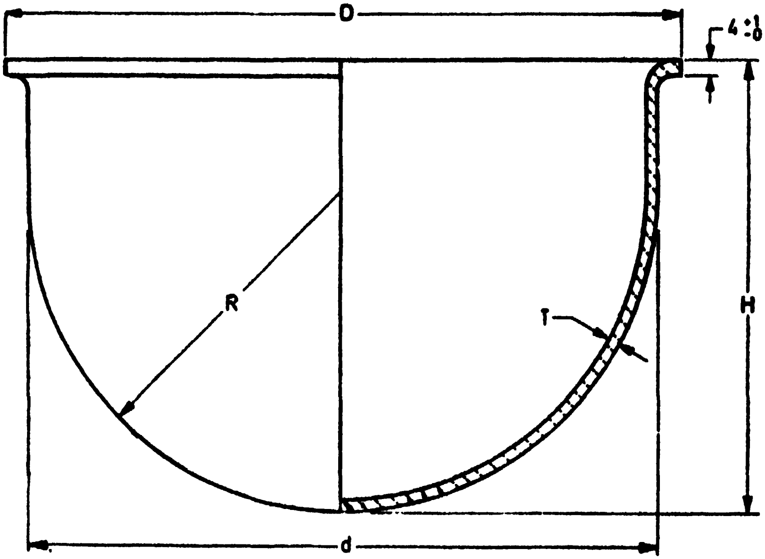
FIG. 1 GLASS GLOBE, SHAPE 1

4. MATERIAL AND WORKMANSHIP

4.1 Globes shall be as free as possible from internal strain. They shall be symmetrical about their axes, uniform in thickness and smooth in finish on the outer side and at the edges.

4.2 Globes shall be free from cracks and as free as possible from stones, blisters, air bubbles, cords, mould marks, chill marks and other visual defects.

4.3 The flange of the globes shall be plane finished with an inclination not exceeding 1 mm.



All dimensions in millimetres.

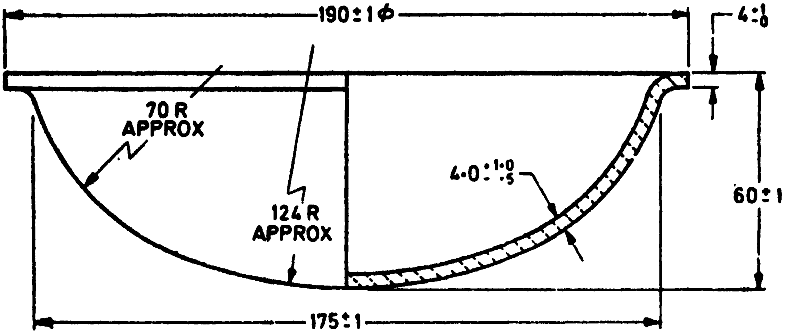
SIZE	*D* (dia)	*d* (dia)	*H*	*R*	*T*
120	132.0+1.0 -0.5	120+0 - 1	99±1	60	2.5+1.0 -0.5
170	182.0+10 -0.5	170+0 -1	120±1	85	3.04+1.0 -0.5

FIG. 2 GLASS GLOBE, SHAPE 2

5. REQUIREMENTS

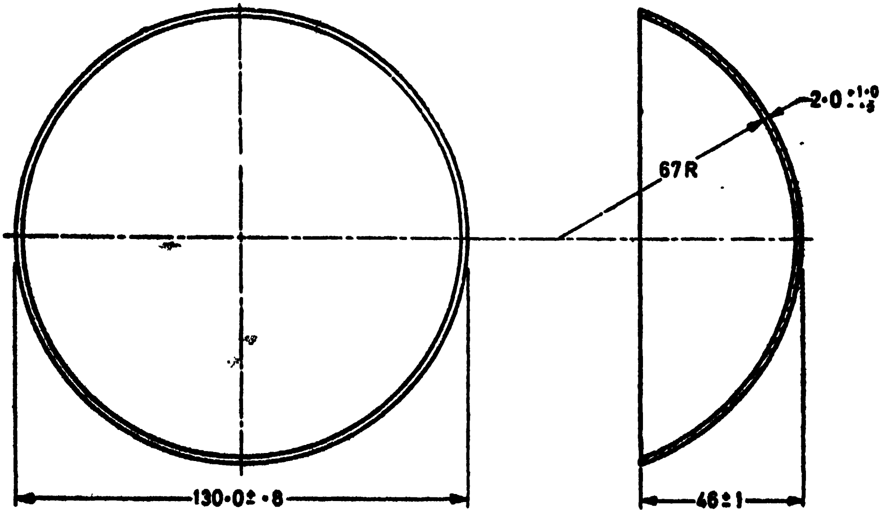
5.1 Shapes and Dimensions — Each globe shall comply with the shape and dimensions as prescribed for it in the respective figure.

5.2 Light Transmission — Globes made of clear glass, conforming to Type A shall show no apparent colour and shall have a transmission of at least 90 percent for visible light (*see* **6.1**).



All dimensions in millimetres.

FIG. 3 GLASS GLOBE, SHAPE 3



All dimensions in millimetres.

FIG. 4 GLASS GLOBE, SHAPE 4

5.2.1 Globes conforming to Types B and C shall have a transmission of not less than 75 and 38 percent respectively for visible light.

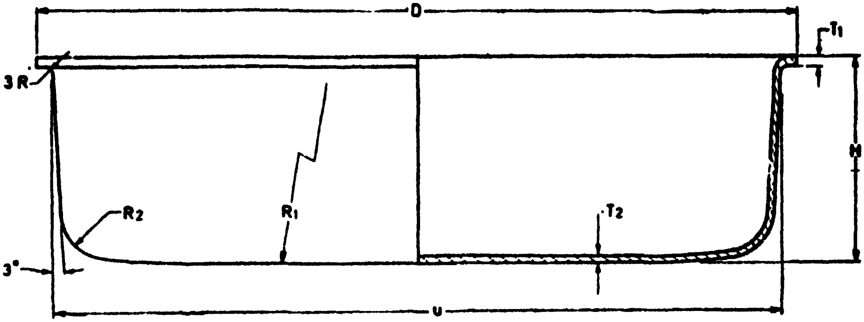
5.2.2 Globes tinted blue shall have a transmission of not less than 7.5 and not more than 12.5 percent for visible light.

5.3 Resistance to Thermal Shock — Globes of Types A and B conforming to Fig. 1 to 4 only shall be capable of withstanding sudden change of temperature without rupture when tested in accordance with 6.2.

6. TESTS

6.1 Test for Light Transmission — Two sub-standard lamps of approximately the same luminous intensity shall be mounted on the standard photometer. One of the two sub-standard lamps shall be covered completely with the globe and its luminous intensity shall be measured against the other lamp. The luminous intensity of the covered lamp when expressed as percentage of the luminous intensity of the uncovered lamp shall be taken as light transmission of globes.

6.1.1 Globes shall be taken as having satisfied the requirements of the test if the light transmission is not less than 90, 75 and 38 percent for Types A, B and C respectively.



All dimensions in millimetres.

SIZE	D (dia)	*d* (dia)	*H*	R_1 (approx)	R_2 (approx)	T_2	T_2
250	262±1	250±1	80±1	800			
300	312±1	300±1	85±1	850	20	4.0+1.0 -0.5	3.0+1.0 -0.5
350	362±1	350±1	90±1	900			

FIG. 5 GLASS GLOBE, SHAPE 5

6.2 Test for Resistance to Thermal Shock — Globes shall be heated in an air-oven (fitted with an air-stirrer) to 87 ± 2°C for 20 minutes. They shall than be taken out by means of asbestos tipped tongs and immediately subjcted to a spray of water of 27 ± 2°C at a pressure of 1 kgf/cm^2.

6.2.1 Globes shall be taken as having satisfied the requirements of the test if they do not develop cracks or break.

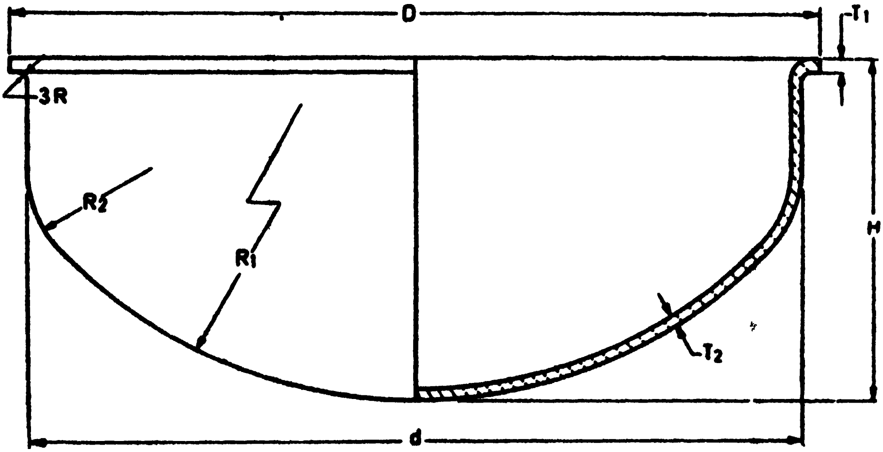
NOTE — Items used for the purpose of this test shall not be subjected to other tests or put into service.

7. DESIGNATION

7.1 Globes shall be designated by name, type, size and figure number.

Example:

Glass Globe A 90-1; to refer to a globe or Type A, Size 90 conforming to Fig. 1 in shape.



All dimensions in millimetres.

SIZE	D (die)	d (die)	H	R_1 (approx)	R_2 (approx)	T_1	T_2
250	262±1	250±1	85±1	230	20		
300	312±1	300±1	90±1	280	25	$4.0^{+1.0}_{-0.5}$	$3.0^{+1.0}_{-0.5}$
350	362±1	350±1	95±1	330	30		

FIG. 6 GLASS GLOBE, SHAPE 6

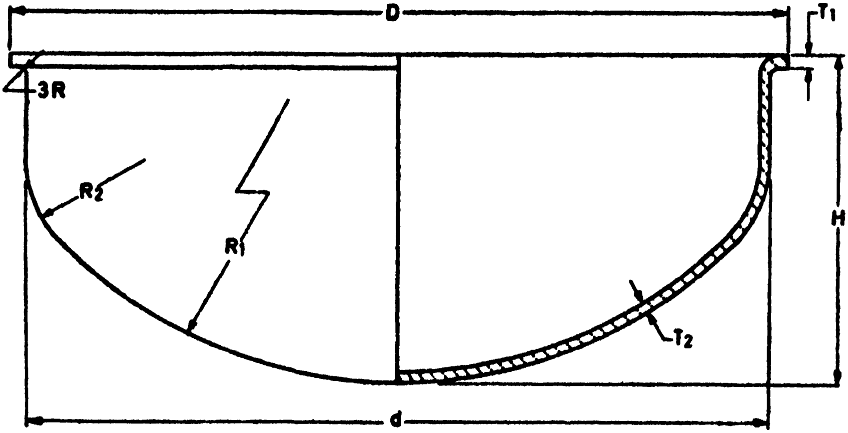
8. MARKING AND PACKING

8.1 Marking — Each globe shall be marked legibly and indelibly with the following at such a location as not to effect the dispersion of light:

a) Manufacturer's name or recognized trade-mark, if any;
b) Designation; and
c) Any other mark of identification desired by the purchaser.

8.1.1 Globes may also be marked with the ISI Certification Mark.

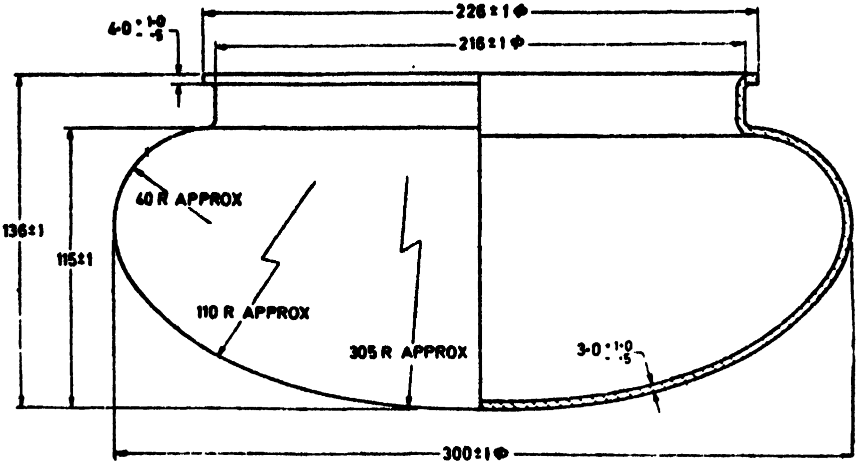
NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act, and the Rules and Regulations made thereunder. Presence of this mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard, under a well-defined system of inspection, testing and quality control during production. This system, which is devised and supervised by ISI and operated by the producer, has the further safeguard that the products as actually marketed are continuously cheched by ISI for conformity to the standard. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufactarers or processors, may be obtained from the Indian Standard Institution.



All dimensions in millimetres.

SIZE	D (dia)	d (dia)	H	R_1 (approx)	R_2 (approx)	T_1	T_2
250	262±1	250±1	110±1	160	40		
300	312±1	300±1	120±1	200	60	$4.0^{+1.0}_{-0.5}$	$3.0^{+1.0}_{-0.5}$
350	362±1	350±1	130±1	240	80		

FIG. 7 GLASS GLOBE, SHAPE 7



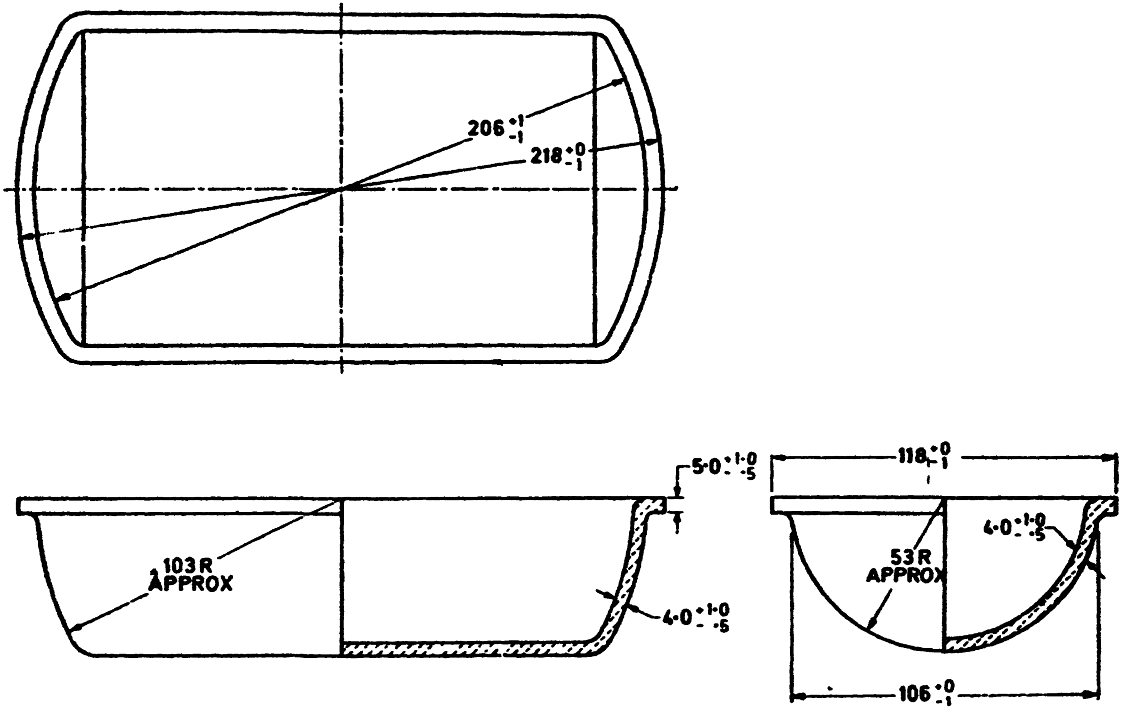
All dimensions in millimetres.

FIG. 8 GLASS GLOBE, SHAPE 8

8.2 Packing — Globes shall be packed as agreed to between the purcha and the supplier.

9. SAMPLING

9.1 The method drawing representative samples of globes and theircrit for conformity with the requirements of the standard shall be as prescri in Appendix A.


206^{+1}_{-1}
218^{+0}_{-1}
103R APPROX
$4{\cdot}0^{+1{\cdot}0}_{-{\cdot}5}$
$5{\cdot}0^{+1{\cdot}0}_{-{\cdot}5}$
118^{+0}_{-1}
53R APPROX
$4{\cdot}0^{+1{\cdot}0}_{-{\cdot}5}$
106^{+0}_{-1}

All dimensions in millimetres.

FIG. 9 GLASS GLOBE, SHAPE 9

APPENDIX A

(*Clause* 9.1)

SAMPLING OF GLASS GLOBES

A-1. SCALE OF SAMPLING

A-1.1 Lot — All glass globes in a consignment of the same type and dimensions shall be grouped to constitute a lot.

A-1.2 Each lot shall be separately examined for various requirements given in this specification. The number of glass globes to be selected in the sample from a lot shall be as given in Table 2.

TABLE 2 NUMBER OF GLASS GLOBES TO BE SELECTED AND PERMISSIBLE NUMBER OF DEFECTIVES

(*Clauses* A-1.2, A-2.1 *and* A-2.2)

LOT SIZE	FOR WORKMANSHIP AND DIMENSIONAL REQUIREMENTS		FOR LIGHT TRANSMISSION TEST	
	Sample Size	Permissible Number of Defectives	Sample Size	Permissible Number of Defectives
(1)	(2)	(3)	(4)	(5)
Up to 50	8	1	3	0
51 ;, 100	13	1	5	0
101 „ 300	20	2	8	0
301 „ 500	32	3	13	1
501 and above	50	5	20	1

A-1.3 Glass globes to be included in the sample shall be selected at random from at least 20 percent of the packages or cartons in the lot.

A-2 NUMBER OF TESTS AND CRITERIA FOR CONFORMITY

A-2.1 All the glass globes selected under **A-1.2** shall be examined for workmanship, finish and dimensional requirements. Any glass globe failing to satisfy one or more of the above requirements shall be called defective. The number of defective glass globes shall not exceed the permissible number given in col 3 of Table 2 if the lot is to be accepted in respect of these characteristics.

A-2.2 The number of glass globes to be tested for the light transmission requirement is given in col 4 of Table 2 and these globes shall be selected from among those selected and found satisfactory under **A-2.1**. If the lot is to be accepted for this characteristic, the number of glass globes failing under this test shall not exceed the corresponding permissible number given in col 5 of Table 2.

A-2.3 The lot shall be finally tested for thermal shock resistance and for this purpose, 3 globes in the case of lot size being 100 or less and 5 globes in the case of lot size above 100, shall be subjected to the prescribed test. No failures shall occur if the lot is to be accepted in respect of thermal shock resistance.

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	*Unit*	*Symbol*
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cdl
Amount of substance	mole	mol

Supplementary Units

Quantity	*Unit*	*Symbol*
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

Quantity	*Unit*	*Symbol*	*Definition*
Force	newton	N	1 N = 1 kg.m/s^2
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1 c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	Pa = 1 N/m^2

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